

REMARKS

In the Office Action, the Examiner rejected claims 19, 20, 35, 36, 40-49, and 53-60. Claims 18, 22-34, 37, 38, 50, and 51 remain withdrawn. Applicants respectfully assert that the claims, as pending, are patentable and are in condition for allowance. Accordingly, claims 19, 20, 21, 35, 36, 39-49, and 52-60 remain pending. In light of the following remarks, Applicants respectfully request reconsideration and allowance of the pending claims.

Claim Rejections Under 35 U.S.C. § 103

In the Office Action, the Examiner rejected claims 19, 35, 36, and 40-47 under 35 U.S.C. § 103(a) as being unpatentable over the Ikeda et al. reference (U.S. Patent No. 5,731,219) in view of the Brickman et al. reference (U.S. Patent No. 3,721,838). Additionally, the Examiner rejected claims 20, 48, 49, and 53-60 under 35 U.S.C. § 103(a) as being unpatentable over the Ikeda reference in view of the Brickman and Gonzalez et al. reference (U.S. Patent No. 5,150,276). As discussed below, Applicants respectfully traverse the rejections.

The burden of establishing a *prima facie* case of obviousness falls on the Examiner. *Ex parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (PTO Bd. App. 1979). Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention absent some teaching or suggestion supporting the combination. *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984). The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 U.S.P.Q.2d. 1430 (Fed. Cir. 1990). Accordingly, to establish a *prima facie* case, the Examiner must not only show that the combination includes *all* of the claimed elements, but also a convincing line of reason as to why one of ordinary skill in the art would have found the claimed invention to have been obvious in light of the teachings of the references. *Ex parte Clapp*, 227 U.S.P.Q. 972 (B.P.A.I. 1985). The Examiner must provide objective evidence, rather than subjective belief and unknown authority, of the requisite motivation or suggestion to combine or modify the cited references. *In re Lee*, 61 U.S.P.Q.2d. 1430 (Fed. Cir. 2002). Moreover, a statement that the proposed modification

would have been “well within the ordinary skill of the art” based on individual knowledge of the claimed elements cannot be relied upon to establish a *prima facie* case of obviousness without some *objective reason to combine* the teachings of the references. *Ex parte Levensgood*, 28 U.S.P.Q.2d 1300 (Bd. Pat. App. & Inter. 1993); *In re Kotzab*, 217 F.3d 1365, 1371, 55 U.S.P.Q.2d 1313, 1318 (Fed. Cir. 2000); *Al-Site Corp. v. VSI Int’l Inc.*, 174 F.3d 1308, 50 U.S.P.Q.2d 1161 (Fed. Cir. 1999).

Independent Claim 19 and the Claims Depending Therefrom

Independent claim 19 recites, *inter alia*, “a substrate having a first conductive line *therein*,” a “*memory cell* programmable to multiple states of resistance,” and “a third conductive line in electrical communication with said first conductive line.” (Emphasis added.)

Despite the Examiner’s assertion that Ikeda discloses all elements of claim 19 except a memory cell with programmable resistance, Ikeda does not teach *a conductive line in the substrate*. While the cited reference teaches a conductive region (the active area) in the substrate, and the reference teaches conductive lines, the reference does not teach a conductive line *in* the substrate. The active areas of the substrate taught by the Ikeda reference are clearly not lines. Instead, Fig. 15 of Ikeda illustrates the *ring* shape of the doped region in the substrate 1. Ikeda, col. 36, ll. 53-55. Accordingly, the conductive region in the substrate disclosed by Ikeda is not a conductive line. As further proof that Ikeda does not teach conductive lines in the substrate, the Ikeda reference teaches field oxide 4 completely surrounding each active area. Ikeda, Fig. 15. The field oxide 4 would block any conductive line in the substrate between memory cells. Indeed, nothing in the Ikeda reference suggests creating a conductive line in the substrate. Of the three conductive lines cited by the Examiner in the Office Action, the word line (WL) 13, the sub-word line (SWL) 29, and the data line (DL) 33, none are located in the substrate as recited in claim 19. Accordingly, the Ikeda reference fails to disclose a substrate having a first conductive line *therein*, as called for in claim 19.

Secondly, the Brickman reference fails to disclose the element of claim 19 for which it was cited by the Examiner: “a *memory cell* programmable to multiple states of resistance.” The Brickman reference teaches a *fuse* capable of providing two states of resistance, not a memory cell. *See* Brickman, col. 2, ll. 15-22. The fuse taught by Brickman disables damaged portions of memory and allows access to redundant memory arrays. While the fuse in Brickman is electrically alterable, it serves none of the other functions of memory; for example, the fuse does not return stored information to other areas of the device. In fact, the operation of the fuse is invisible to other areas of the device. *See* Brickman, col. 2, ll. 22-23. Moreover, the Brickman reference explicitly distinguishes between the fuse and a memory cell, explaining that “[s]ince the present invention is directed to an alterable decoder, further description of the memory operation is not believed necessary.” Brickman, col. 5, ll. 33-35. Thus, the cited reference fails to disclose a *memory cell* programmable to multiple states of resistance.

Finally, either the Ikeda reference does not teach “a third conductive line in electrical communication with said first conductive line,” as called for in claim 19, or the Ikeda reference as explained by the Examiner is inoperative. In the Office Action, the Examiner asserted that Ikeda teaches “a third conductive line 33 in electrical communication with the first conductive line [13].” However, if the Examiner is correct, the device taught by Ikeda short circuits around the memory cell. Office Action, pg. 2. Ikeda teaches a memory cell in series between the first conductive line 13 and the third conductive line 33. Thus, if the first conductive line 13 connects directly to the third conductive line 33, the memory cell cannot receive or return data. Specifically, the Ikeda reference identifies the first conductive line 13 as a word line (WL) 13 in column 37 lines 13-15 and the third conductive line 33 as a data line (DL) 33 in column 51 lines 22-32. Fig. 5 of Ikeda provides an electrical schematic illustrating the position of the memory cell in series between the data lines 33 and the word lines 13. If a word line 13 is in direct electrical communication with a data line 33, the memory device is short circuited, rendering it incapable of returning or storing information. Thus, either the

Examiner did not identify a third conductive line in electrical communication with a first conductive line, or the Ikeda reference is inoperative.

Therefore, Applicants respectfully assert that independent claim 19 and its respective dependent claims 35, 36, and 40-47 are not rendered obvious by the cited references. With the foregoing in mind, Applicants respectfully request reconsideration and allowance of the instant claims.

Independent Claim 20 and the Claims Depending Therefrom

Independent claim 20 recites, *inter alia*, “forming a digit line *in* a substrate,” and “each *memory cell* comprising an element having an alterable resistance.” (Emphasis added.)

As discussed above, the cited references fail to disclose a digit line *in* the substrate. For example, all conducting lines taught by Ikeda are above the substrate, not in it. Moreover, the doped, and therefore potentially conducting, region of the substrate taught by Ikeda is in the shape of a ring, not a line. Nothing in Ikeda even suggests creating doped lines in the substrate. Indeed, the three conductive lines, the word line 13, the sub-word line 29, and the data line 33, cited by the Examiner as corresponding to the conductive lines of the instant claim are all clearly above, not in, the substrate. Ikeda, Fig. 9. Thus, the cited references do not teach forming a digit line *in* the substrate.

Secondly, and again as discussed above, the Brickman reference does not disclose a “*memory cell* comprising an element having an alterable resistance,” as called for in claim 20. (Emphasis added.) Brickman discloses a *fuse* with alterable resistance used to disable damaged portions of memory, not a memory cell used to store and return data. Indeed, the cited reference teaches that the fuse should not return information to other areas of the circuit. Moreover, the cited reference itself distinguishes between a fuse and a memory cell, further illustrating that they are not interchangeable parts. Accordingly, the Brickman reference fails to disclose a *memory cell* with an element having alterable resistance.

Therefore, Applicants respectfully assert that independent claim 20 and its respective dependent claims, 48, 49, and 53-60, are not rendered obvious by the cited reference. With the foregoing in mind, Applicants respectfully request reconsideration and allowance of the instant claims.

Conclusion


In view of the remarks set forth above, Applicants respectfully request allowance of the pending claims. If the Examiner believes that a telephonic interview will help speed this application toward issuance, the Examiner is invited to contact the undersigned at the telephone number listed below.

General Authorization for Fee Payments and Extensions of Time

In accordance with 37 C.F.R. § 1.136, Applicants hereby provide a general authorization to treat this and any future reply requiring an extension of time as incorporating a request therefor. Furthermore, Applicants authorize the Commissioner to charge the requisite fee of **\$110.00** for a **one-month extension of time**, and any additional fees which may be required, to the credit card listed on the attached PTO-2038. However, if the PTO-2038 is missing, if the amount listed thereon is insufficient, or if the amount is unable to be charged to the credit card for any other reason, the Commissioner is authorized to charge Deposit Account No. 06-1315; Order No. MCRO:0125--4/FLE (94-0281.04).

Respectfully submitted,

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